

Power Splitter/Combiner

CSC-2-153+

2 Way-0° 50Ω 5000 to 15000 MHz

Maximum Ratings

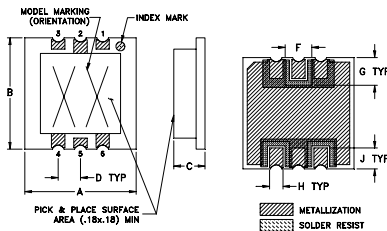
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	3W max.
Internal Dissipation	0.125W max.

Permanent damage may occur if any of these limits are exceeded.

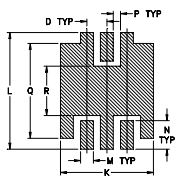
Pad Connections

SUM PORT	2
PORT 1	4
PORT 2	6
GROUND	1,3,5

Outline Drawing

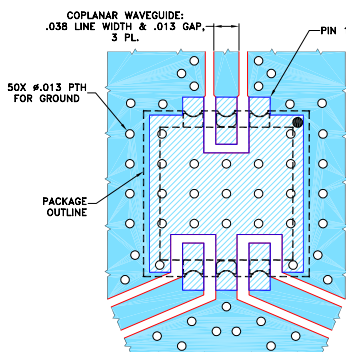


PCB Land Pattern



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H	J
.250	.250	.07	.05		.060	0.062	0.03	0.047
6.35	6.35	1.78	1.27		1.52	1.57	0.76	1.19
K	L	M	N	P	Q	R		wt
0.232	.291	.032	.071	.018	.237	.123		grams
5.89	7.39	0.81	1.80	0.46	6.02	3.12		0.06

Demo Board MCL P/N: TB-707+
Suggested PCB Layout (PL-399)

NOTES:

- TRACE WIDTH PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020"±.0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

Features

- wideband, 5000 to 15000 MHz
- low insertion loss, 0.6 dB typ.
- excellent isolation, 20 dB typ.
- good amplitude unbalance, 0.2dB typ.
- aqueous washable

Applications

- cellular
- SHF
- communication systems
- CATV
- defense



CASE STYLE: MW1663
PRICE: Contact Sales Dept.

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		5000		15000	MHz
Insertion Loss Above 3.0 dB	5000-15000	—	0.6	1.5	dB
Isolation	5000-15000	14	20	—	dB
Phase Unbalance	5000-15000	—	3.0	9.0	Degree
Amplitude Unbalance	5000-15000	—	0.2	0.9	dB
VSWR (Port S)	5000-15000	—	1.5	2.3	:1
VSWR (Port 1-2)	5000-15000	—	1.6	2.2	:1

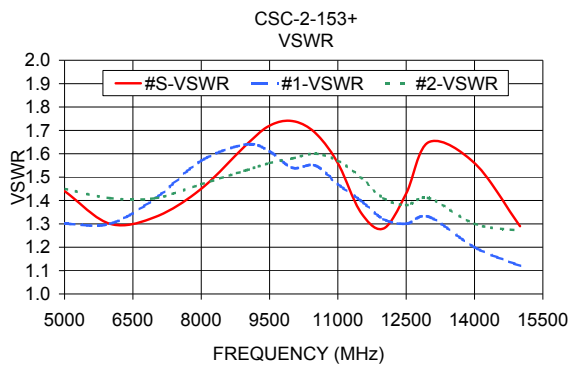
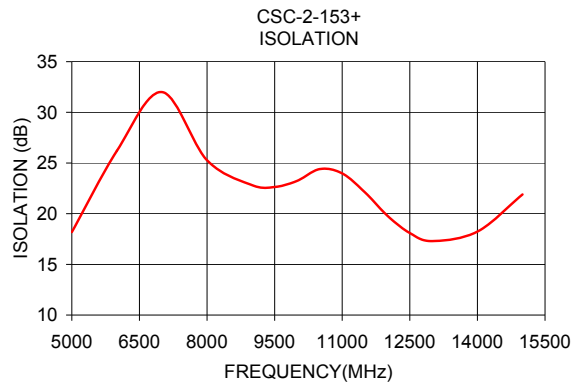
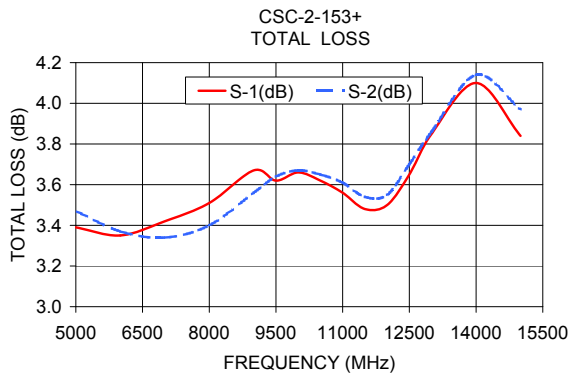
Electrical Schematic



Typical Performance Data

Frequency (MHz)	Total Loss ¹ (dB)		Amplitude Unbalance (dB)	Isolation (dB)	Phase Unbalance (deg.)	VSWR S	VSWR 1	VSWR 2
	S-1	S-2						
5000.00	3.39	3.47	0.07	18.19	0.59	1.44	1.30	1.45
6000.00	3.35	3.37	0.01	26.21	0.11	1.30	1.30	1.41
7000.00	3.42	3.34	0.08	32.00	0.01	1.33	1.41	1.41
8000.00	3.51	3.40	0.11	25.27	0.45	1.45	1.57	1.47
9000.00	3.67	3.56	0.11	22.82	0.84	1.64	1.64	1.53
9500.00	3.62	3.64	0.02	22.64	1.14	1.72	1.61	1.56
10000.00	3.66	3.67	0.01	23.24	0.81	1.74	1.54	1.58
10500.00	3.62	3.65	0.04	24.40	0.88	1.69	1.55	1.60
11000.00	3.56	3.61	0.05	23.98	1.06	1.56	1.47	1.57
11500.00	3.48	3.54	0.06	22.12	0.76	1.35	1.40	1.50
12000.00	3.50	3.55	0.06	19.81	0.64	1.28	1.32	1.41
12500.00	3.65	3.70	0.05	18.09	0.66	1.43	1.30	1.38
13000.00	3.85	3.86	0.01	17.30	0.79	1.65	1.33	1.41
14000.00	4.10	4.14	0.04	18.24	1.35	1.56	1.20	1.30
15000.00	3.84	3.97	0.13	21.90	2.10	1.29	1.12	1.27

1. Total Loss = Insertion Loss + 3dB splitter loss.



Notes

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2 Way-0° Power Splitter/Combiner

CSC-2-153+

Typical Performance Data

FREQUENCY (MHz)	TOTAL LOSS ¹ (dB)		AMPLITUDE UNBALANCE (dB)	ISOLATION (dB)	PHASE UNBALANCE (deg.)	FREQUENCY (MHz)	VSWR (:1)		
	S-1	S-2					S	1	2
5000.0	3.39	3.47	0.07	18.19	0.59	5000.0	1.44	1.30	1.45
5200.0	3.37	3.44	0.07	19.52	0.46	5200.0	1.38	1.29	1.45
5400.0	3.35	3.41	0.07	20.96	0.45	5400.0	1.34	1.29	1.44
5600.0	3.35	3.40	0.05	22.59	0.34	5600.0	1.31	1.29	1.43
5800.0	3.35	3.38	0.03	24.33	0.23	5800.0	1.30	1.28	1.43
6000.0	3.35	3.37	0.01	26.21	0.11	6000.0	1.30	1.30	1.41
6100.0	3.36	3.36	0.01	27.25	0.03	6100.0	1.30	1.30	1.41
6200.0	3.35	3.36	0.00	28.32	0.04	6200.0	1.31	1.30	1.41
6300.0	3.36	3.35	0.00	29.44	0.09	6300.0	1.31	1.31	1.40
6400.0	3.35	3.35	0.01	30.50	0.12	6400.0	1.31	1.32	1.40
6500.0	3.36	3.35	0.01	31.40	0.13	6500.0	1.31	1.33	1.40
6600.0	3.37	3.35	0.02	32.25	0.09	6600.0	1.31	1.35	1.40
6700.0	3.38	3.35	0.03	32.67	0.02	6700.0	1.31	1.36	1.40
6800.0	3.39	3.34	0.05	32.72	0.01	6800.0	1.32	1.37	1.40
6900.0	3.41	3.34	0.07	32.49	0.01	6900.0	1.33	1.39	1.40
7000.0	3.42	3.34	0.08	32.00	0.01	7000.0	1.33	1.41	1.41
7100.0	3.45	3.34	0.11	31.19	0.02	7100.0	1.35	1.42	1.41
7200.0	3.46	3.34	0.12	30.31	0.04	7200.0	1.36	1.43	1.42
7300.0	3.47	3.34	0.13	29.47	0.04	7300.0	1.37	1.45	1.42
7400.0	3.48	3.34	0.14	28.61	0.03	7400.0	1.39	1.47	1.43
7500.0	3.49	3.35	0.15	27.87	0.04	7500.0	1.40	1.49	1.43
7600.0	3.49	3.35	0.14	27.29	0.02	7600.0	1.40	1.51	1.44
7700.0	3.48	3.36	0.12	26.68	0.04	7700.0	1.41	1.53	1.45
7800.0	3.49	3.37	0.12	26.11	0.13	7800.0	1.42	1.54	1.45
7900.0	3.50	3.38	0.11	25.71	0.28	7900.0	1.43	1.55	1.46
8000.0	3.51	3.40	0.11	25.27	0.45	8000.0	1.45	1.57	1.47
8100.0	3.52	3.41	0.11	24.79	0.56	8100.0	1.47	1.57	1.48
8200.0	3.54	3.42	0.12	24.45	0.70	8200.0	1.49	1.58	1.48
8300.0	3.56	3.43	0.13	24.16	0.78	8300.0	1.52	1.59	1.49
8400.0	3.60	3.45	0.16	23.92	0.84	8400.0	1.55	1.59	1.50
8500.0	3.63	3.47	0.16	23.65	0.87	8500.0	1.57	1.59	1.51
8600.0	3.65	3.49	0.17	23.44	0.88	8600.0	1.59	1.60	1.51
8700.0	3.66	3.50	0.16	23.21	0.89	8700.0	1.60	1.61	1.51
8800.0	3.65	3.51	0.14	23.06	0.81	8800.0	1.61	1.62	1.52
8900.0	3.66	3.53	0.13	22.88	0.80	8900.0	1.62	1.63	1.53
9000.0	3.67	3.56	0.11	22.82	0.84	9000.0	1.64	1.64	1.53
9500.0	3.62	3.64	0.02	22.64	1.14	9500.0	1.72	1.61	1.56
10000.0	3.66	3.67	0.01	23.24	0.81	10000.0	1.74	1.54	1.58
10500.0	3.62	3.65	0.04	24.40	0.88	10500.0	1.69	1.55	1.60
11000.0	3.56	3.61	0.05	23.98	1.06	11000.0	1.56	1.47	1.57
11500.0	3.48	3.54	0.06	22.12	0.76	11500.0	1.35	1.40	1.50
12000.0	3.50	3.55	0.06	19.81	0.64	12000.0	1.28	1.32	1.41
12500.0	3.65	3.70	0.05	18.09	0.66	12500.0	1.43	1.30	1.38
13000.0	3.85	3.86	0.01	17.30	0.79	13000.0	1.65	1.33	1.41
14000.0	4.10	4.14	0.04	18.24	1.35	14000.0	1.56	1.20	1.30
14500.0	3.96	4.03	0.07	21.09	1.73	14500.0	1.32	1.03	1.19
15000.0	3.84	3.97	0.13	21.90	2.10	15000.0	1.29	1.12	1.27

¹Total Loss = Insertion Loss + 3dB Splitter Loss



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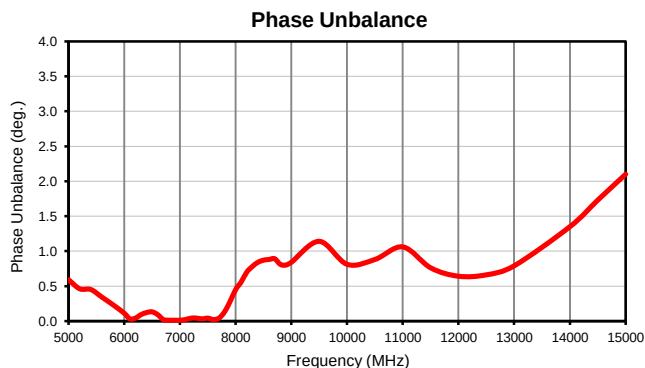
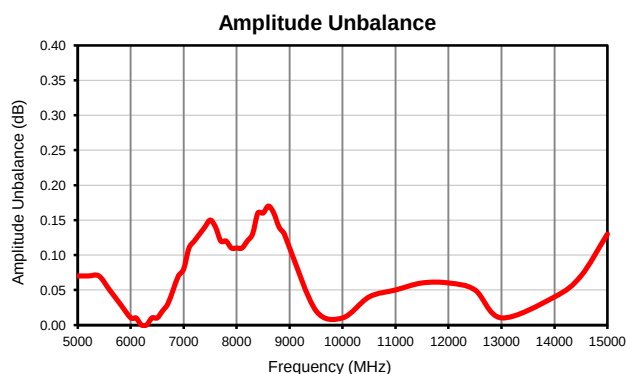
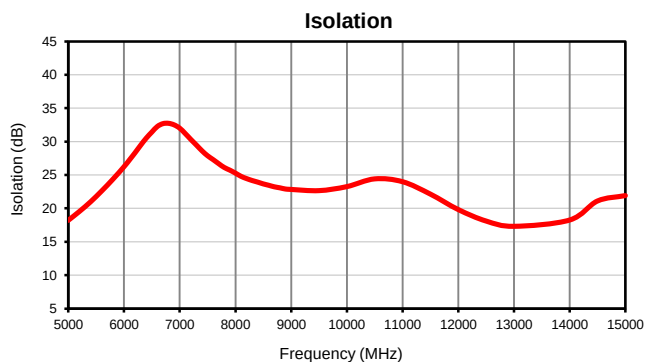
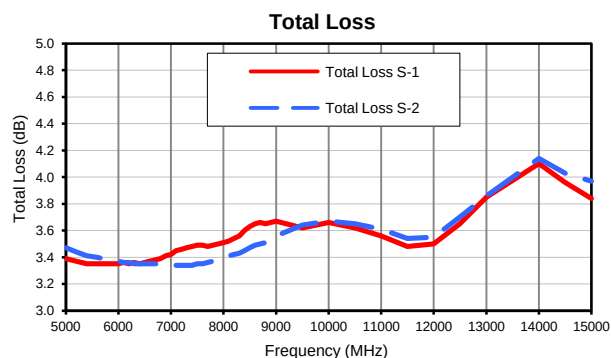


IF/RF MICROWAVE COMPONENTS

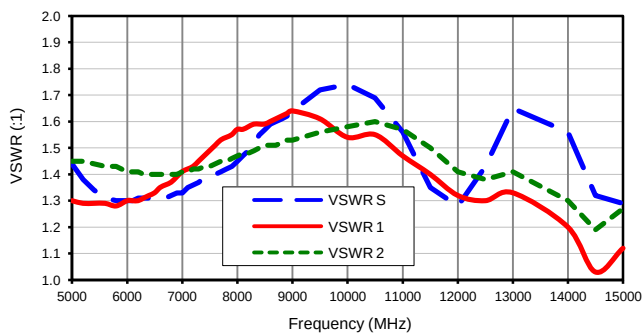


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CSC-2-153+
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Typical Performance Curves

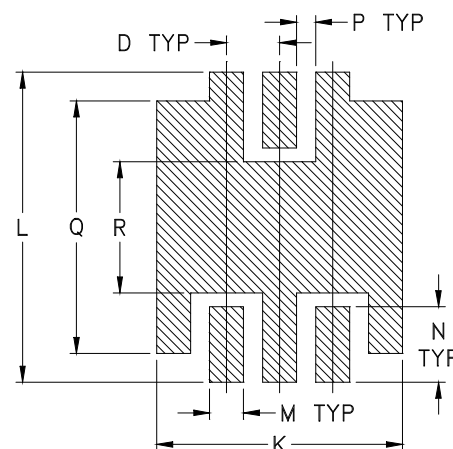
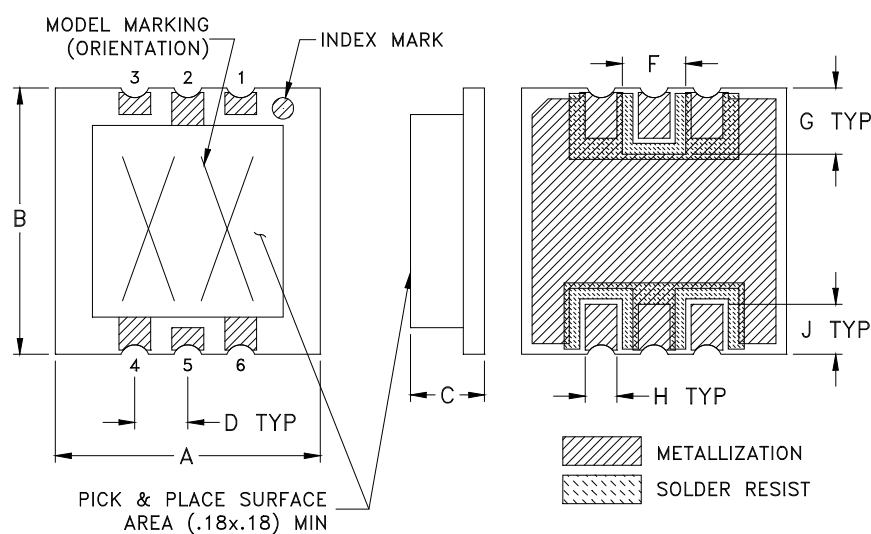


VSWR



Outline Dimensions

PCB Land Pattern



Suggested Layout,
Tolerance to be within ± 0.002

CASE#	A	B	C	D	E	F	G	H	J	K	L	M
MW1663	.250 (6.35)	.250 (6.35)	.07 (1.78)	.05 (1.27)	- -	.060 (1.53)	.062 (1.57)	.030 (0.76)	.047 (1.19)	.232 (5.89)	.291 (7.39)	.032 (0.81)

CASE#	N	P	Q	R	WT, GRAM
MW1663	.071 (1.80)	.018 (0.46)	.237 (6.02)	.123 (3.12)	0.06

Dimensions are in inches (mm). Tolerances: 3 Pl. $\pm .003$ unless otherwise specified

Notes:

- Case material: Plastic.
- Base Material: 20 mil thk. Laminate.
- Termination finish: For RoHS Case Style: Tin plate. All models, (+) suffix.



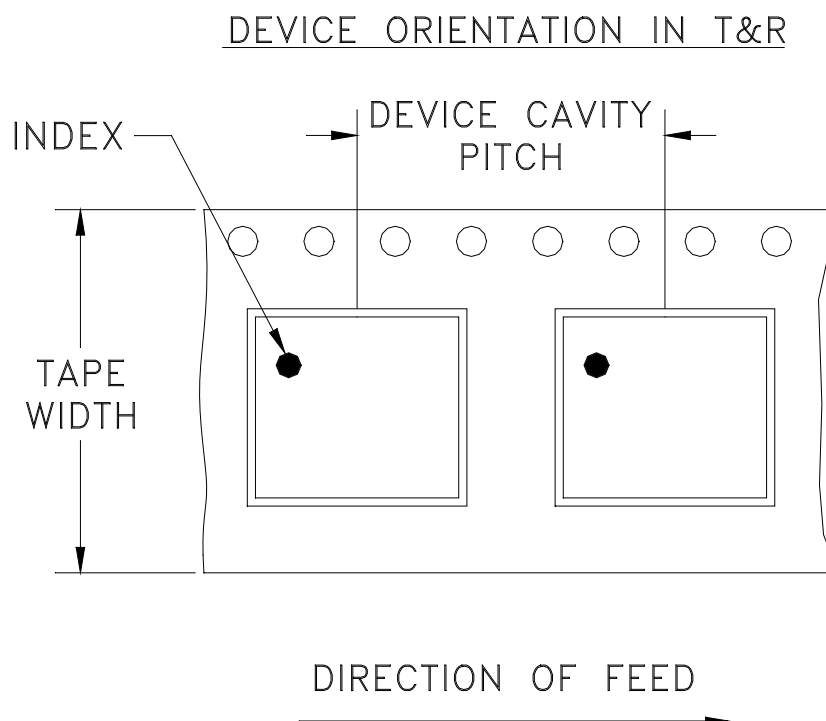
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Tape & Reel Packaging TR-F66



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note	
8	4	7	Small quantity standard	20
				50
				100
				200
				500
		7	Standard	1000, 2000, 3000

Note: Please consult individual model data sheet to determine device per reel availability.

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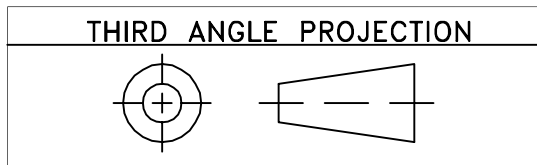


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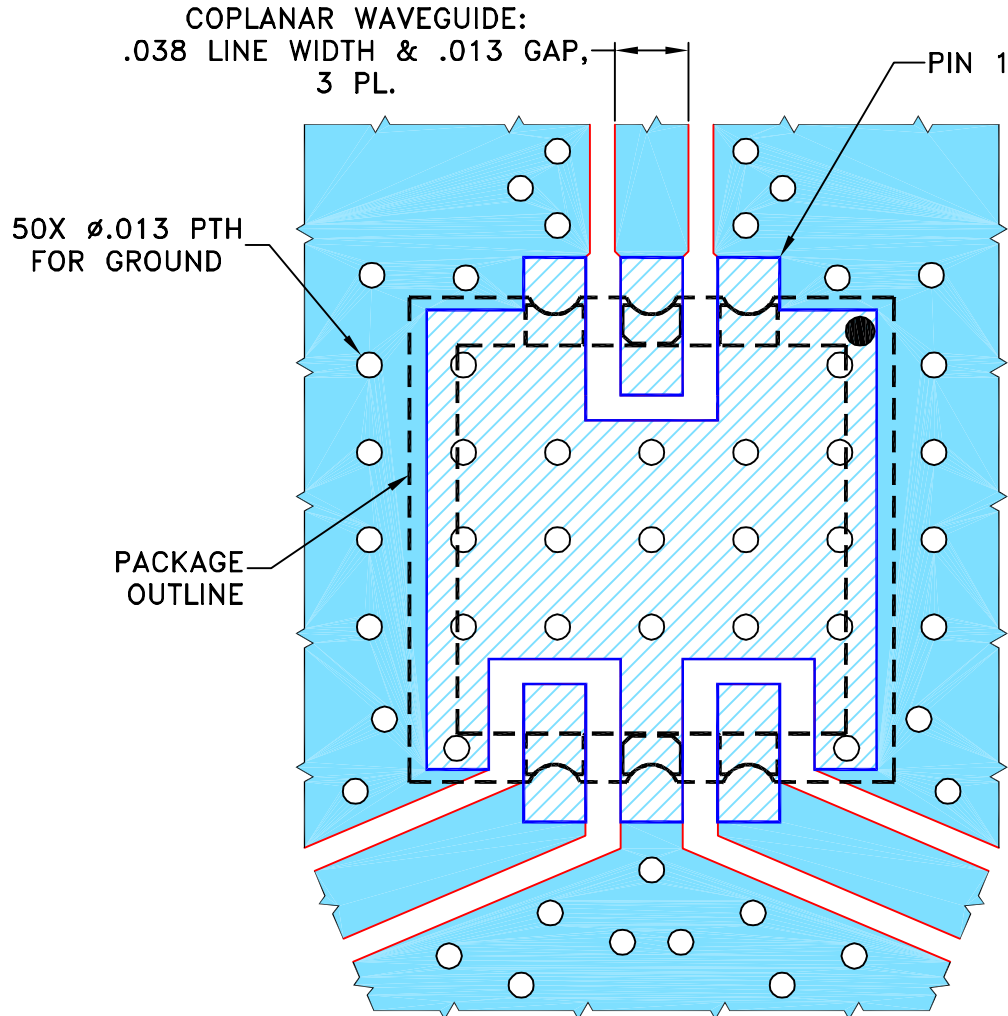
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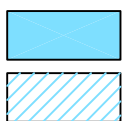
REVISIONS					
REV OR	ECN No.	DESCRIPTION	DATE	DR	AUTH
	M144564	NEW RELEASE	03/19/14	AV	JC

SUGGESTED MOUNTING CONFIGURATION FOR MW1663 CASE STYLE, "06SP14" PIN CODE



NOTES:

- TRACE WIDTH PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020"±.0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



SOLID BLUE RECTANGLE DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).

HATCHED RECTANGLE DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

UNLESS OTHERWISE SPECIFIED	INITIALS		DATE
DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005 ANGLES ± FRACTIONS ±	DRAWN	AV	02/24/14
	CHECKED	IL	03/19/14
	APPROVED	JC	03/19/14



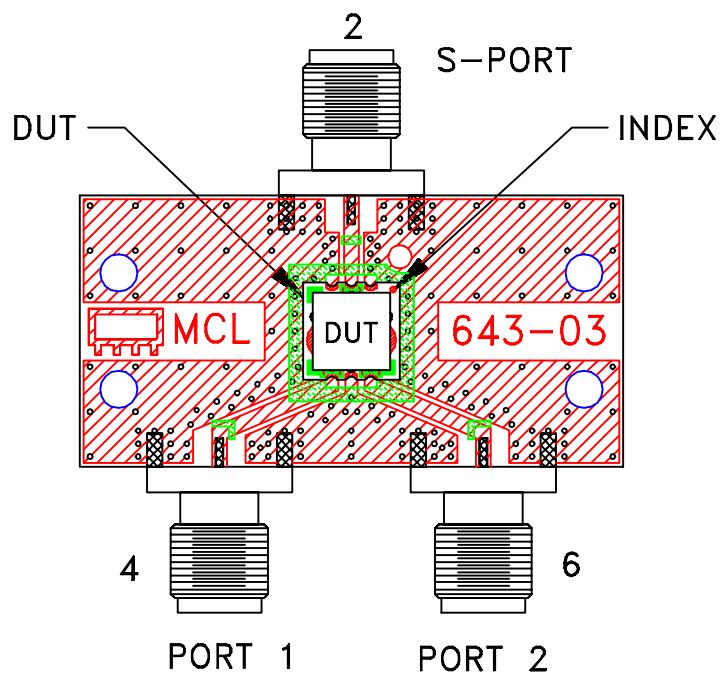
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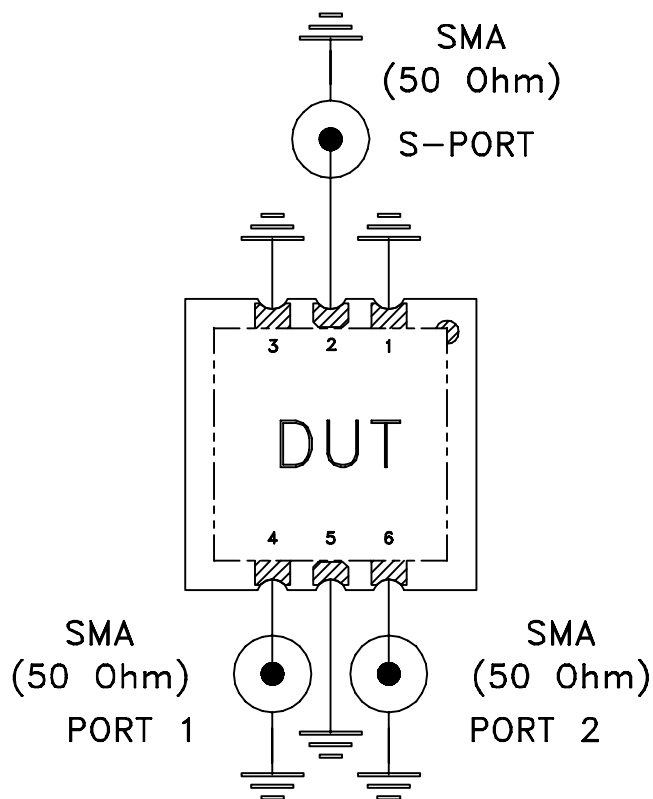
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SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-399	REV: OR
FILE: 98PL399	SCALE: 10:1	SHEET: 1 OF 1	

Evaluation Board and Circuit



TB-707+



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.020 inch.

 Mini-Circuits®



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, 95% Coverage
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215